18th European Weed Research Society Symposium

EWRS 2018

17-21 June 2018
Ljubljana, Slovenia

New approaches for smarter weed management

Book of Abstracts

www.ewrs2018.org

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Organiser
Kmetijski inštitut Slovenije (KIS) – Agricultural Institute of Slovenia, Hacquetova ulica 17, 1000 Ljubljana, Slovenija

Editor
Andrej Simončič

Published by
Kmetijski inštitut Slovenije, 2018

The publication is published e-only – http://www.ewrs.org

Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani
COBISS.SI-ID=295336960
ISBN 978-961-6998-21-5 (pdf)

The critical period of weed interference in upland rice in the Mid-West of Madagascar

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In lowland rice, weeds are generally well controlled by submergence, line transplanting and mechanical weeding. In upland rain-fed rice, weed control is highly challenging especially due to a peak workload at the beginning of the rainy season and weeding is done manually. This study aimed at determining the critical period of weed interference in a low-input upland rice cropping system, in order to optimize the timing of weeding. During the rainy season 2016-2017, a field experiment was conducted in Madagascar, Ivory station (19°33.29'S, 46° 24.913'E). Eight different weeding regimes were tested: a group of early weed interference (weedy until 20 DAS [days after sowing], 40 DAS and 60 DAS); a group of late weed interference (weedy from 20 DAS, 40 DAS and 60 DAS); two controls (weed-free and weedy). The experimental layout was a randomized complete block design with four replications. Data collected were weed cover at 20, 40 and 60 DAS, rice grain yield and weed biomass at harvest. The average rice yield in the weed-free control was 2.020 $kg.ha^{-1}$, and in the weedy control it dropped down to 10 $kg.ha^{-1}$ indicating more than 99% of yield loss. Early weed interference until 20, 40, and 60 DAS caused respectively yield losses of 6%, 60% and 87%; and late weed interference from 20, 40 and 60 DAS caused respectively yield losses of 63%, 39% and 9%. It indicated that weed presence before 20 DAS and after 60 DAS induced minor yield losses, while in-between these dates rice should be kept free from weed competition to avoid substantial losses. This information should advise farmers to better plan the timing of weeding, avoiding to invest labour in weeding when only a small increase in yield can be expected. This experiment will be repeated in the coming rainy season to confirm these results.